

Pre-AP Geometry Date_____ 6.3 Assignment
Proving Quadrilaterals are parallelograms (pp 338-341)
Omit 17-19, 22

Page 1

1. What is your name?

Decide whether you are given enough information to determine that the quadrilateral is a parallelogram.

2. Opposite sides are congruent.

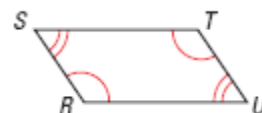
3. Two pairs of adjacent angles are congruent.

4. Diagonals bisect each other.

5. Adjacent angles are supplementary.

6. Prove “If both pairs of opposite angles are congruent, then the quadrilateral is a parallelogram.”

Given: $\angle R \cong \angle T$
 $\angle S \cong \angle U$



Prove: RSTU is a \square .

Plan for proof: Show that $\sum 2(\angle S) + 2(\angle T) = 360^\circ$, so $\angle S$ & $\angle T$ are supplementary
and $\overline{SR} \parallel \overline{UT}$.

Pre-AP Geometry Date_____ 6.3 Assignment
Proving Quadrilaterals are parallelograms (pp 338-341)
Omit 17-19, 22

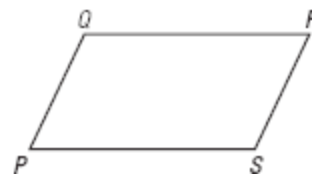
Page 2

7. Prove “If an angle of a quadrilateral is supplementary to both of its adjacent angles, then the quadrilateral is a parallelogram.”

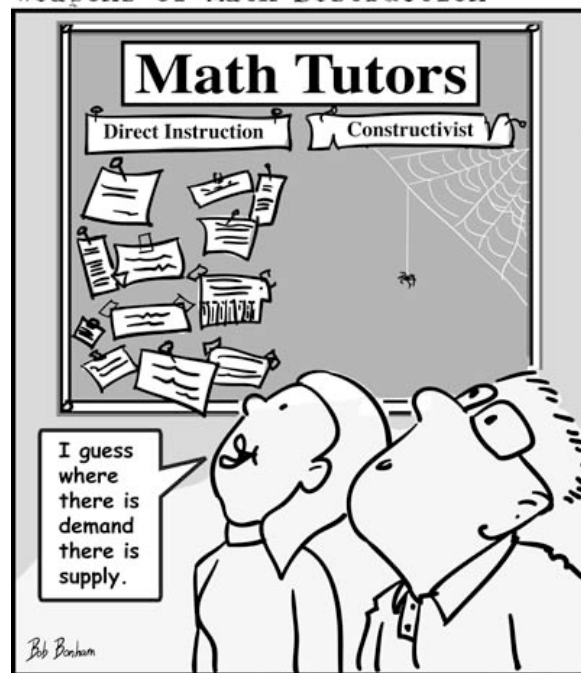
Given: $\angle P$ is supplementary to $\angle Q$ & $\angle S$.

Prove: PQRS is a \square .

Plan for proof: Show that the opposite sides of PQRS are parallel.



Weapons of Math Destruction™



Bob Bonham

Pre-AP Geometry **Date** _____ **6.3 Assignment**
Proving Quadrilaterals are parallelograms (pp 338-341)
Omit 17-19, 22

Page 3

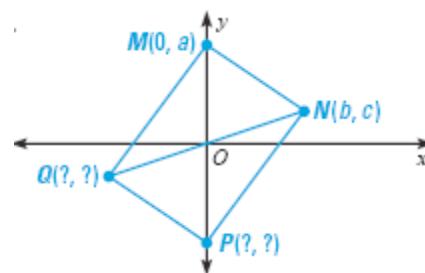
Complete the coordinate proof of “If the diagonals of a quadrilateral bisect each other, then the quadrilateral is a parallelogram.”

Given: Diagonals \overline{MP} & \overline{NQ} bisect each other.

Prove: $MNPQ$ is a parallelogram.

Plan for proof: Show that the opposite sides of $MNPQ$ have the same slope.

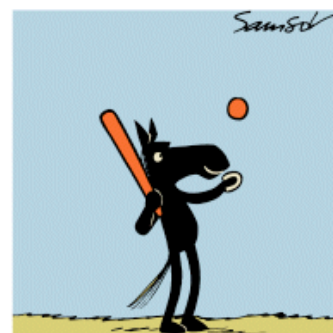
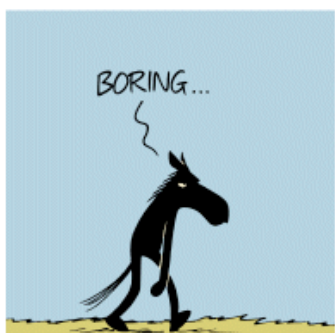
Place $MNPQ$ in the coordinate plane so the diagonals intersect at the origin and \overline{MP} lies on the y -axis. Let the coordinates of M be $(0, a)$ and the coordinates of N be (b, c) .



8. What are the coordinates of P ? Explain your reasoning and label the coordinates on the graph.

9. What are the coordinates of Q ? Explain your reasoning and label the coordinates on your graph.

10. Find the slope of each side of $MNPQ$ and show that the slopes of opposite sides are equal.



Omit 17-19, 22

Prove that the points represent the vertices of a parallelogram. Use a different method for each exercise.

11. A(-4, 7), B(3, 0), C(2, -5), & D(-5, 2)

12. A(-2, 8), B(2, 7), C(5, 1), & D(1, 2)



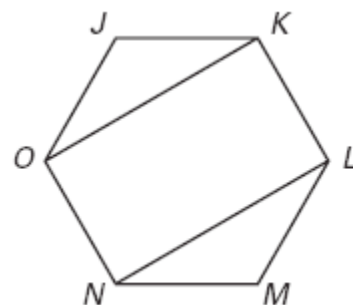
Omit 17-19, 22

Find all the possible coordinates for the fourth vertex of a parallelogram with the given vertices.

13. $(4, -1)$, $(-4, 1)$, & $(0, 8)$

14. $(3, -4)$, $(-2, -1)$, & $(1, 2)$

15. **Given:** Regular hexagon JKLMNO
Prove: OKLN is a parallelogram.

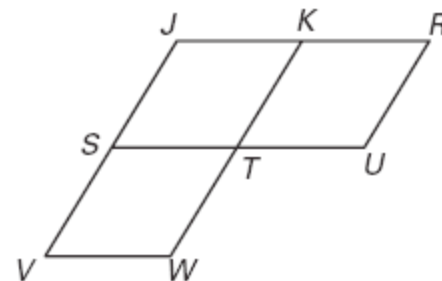


Pre-AP Geometry Date_____ 6.3 Assignment
 Proving Quadrilaterals are parallelograms (pp 338-341)
 Omit 17-19, 22

Page 6

16. **Given:** VWKJ & SJRU are parallelograms.

Prove: $\angle W \cong \angle U$

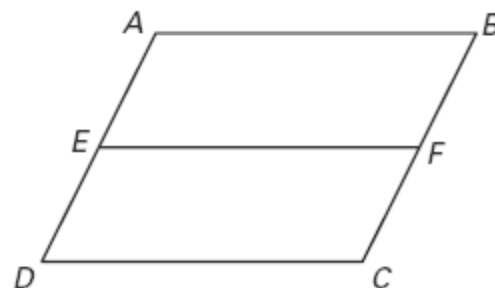


$\square ABCD$

17. **Given:** E is the midpoint of \overline{AD} .

F is the midpoint of \overline{BC} .

Prove: Quadrilateral $ABFE$ is a parallelogram.



Review.

Rewrite the biconditional statement as a conditional statement and its converse. (Chapter 2 Section 2)

18. $x^2 + 2 = 2$ if and only if $x = 0$.

Pre-AP Geometry Date _____ 6.3 Assignment
Proving Quadrilaterals are parallelograms (pp 338-341)
Omit 17-19, 22

Page 7

Rewrite the biconditional statement as a conditional statement and its converse. (Chapter 2 Section 2)

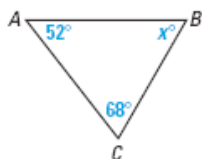
19. $4x + 7 = x + 37$ if and only if $x = 10$.

20. A quadrilateral is a parallelogram if and only if each pair of opposite sides are parallel.

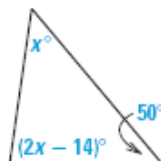
21. Write an equation of the line that is perpendicular to $y = -4x + 2$ and passes through $(1, -2)$. (Chapter 3 section 7)

Find the value of x . (Chapter 4 Section 1)

22.



23.



24.

